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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,886	10/22/2003	Alan D. Crapo	3174-000019	6807

27572 7590 01/27/2005

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EXAMINER

LAM, THANH

ART UNIT PAPER NUMBER

2834

DATE MAILED: 01/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/690,886	Applicant(s) CRAPO ET AL.	
	Examiner Thanh Lam	Art Unit 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Forbes et al. (US 5,918,360).

Regarding claim 1, Forbes et al. disclose a brushless permanent magnet electric machine, comprising: a stator assembly including a stator core that defines slots (85), stator teeth (57) having a generally "T"-shaped cross section, and winding wire (67) wound around said stator teeth, wherein a radially outer edge of said stator teeth defines crowned surface (63); and a rotor including permanent magnets (105) defining n poles, wherein n is an integer greater than zero.

Regarding claim 2, Forbes et al. disclose said stator is located inside of said rotor.

Regarding claim 3, Forbes et al. disclose said stator core is formed by a plurality of stacked stator laminations.

Regarding claim 4, Forbes et al. disclose a first radius of said crowned surface is less than a second radius defined by a circle that is tangent to a radially outermost point of said crowned surface (63) of said stator teeth.

Regarding claim 5, Forbes et al. disclose a slot opening is an angle between circumferential facing edges of adjacent stator teeth and a tooth pitch is an angle between centers of adjacent stator teeth and wherein said slot opening is within a range of 10% to 20% of said tooth pitch.

Regarding claim 6, Forbes et al. disclose a first air gap between an end of said crowned surface and said permanent magnets is within a range of 1.25 to 2.00 times a second air gap between a center of said crowned surface and said permanent magnets.

Regarding claim 7, Forbes et al. disclose an inside-out brushless permanent magnet electric machine, comprising: an internal stator assembly including a stator core that defines slots (85), stator teeth having a generally T-shaped cross section, and winding wire wound around said stator teeth, wherein a radially outer edge of said stator teeth defines a crowned surface (63); and an external rotor assembly that rotates about said internal stator assembly and that includes permanent (105) magnets defining n poles, wherein n is an integer greater than zero.

Regarding claim 8, Forbes et al. disclose said stator core is formed by a plurality of stacked stator laminations.

Regarding claim 9, Forbes et al. disclose a first radius of said crowned surface is less than a second radius defined by a circle that is tangent to a radially outermost point of said crowned surface of said stator teeth.

Regarding claim 10, Forbes et al. disclose a slot opening is an angle between circumferential facing edges of adjacent stator teeth and tooth pitch is an angle between

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centers of adjacent stator teeth, and wherein said slot opening is within a range of 10% to 20% of said tooth pitch.

Regarding claim 11, Forbes et al. disclose wherein a first air gap between an end of said crowned surface and said permanent magnets is within a range of 1.25 to 2.00 times a second air gap between a center of said crowned surface and said permanent magnets.

Regarding claim 12, Forbes et al. disclose a brushless permanent magnet electric machine, comprising: a stator assembly including a stator core that defines slots, stator teeth having a generally T-shaped cross section, and winding wire wound around said stator teeth, wherein a radially outer edge of said stator teeth defines a crowned surface, and a slot opening between adjacent stator teeth is at least 10% of a tooth pitch of said adjacent stator teeth; and a rotor including permanent magnets defining n poles, wherein n is an integer greater than zero.

Regarding claim 13, Forbes et al. disclose said stator is located inside of said rotor.

Regarding claim 14, Forbes et al. disclose said stator core is formed by a plurality of stacked stator laminations.

Regarding claim 15, Forbes et al. disclose a first radius of said crowned surface is less than a second radius defined by a circle that is tangent to a radially outermost point of said crowned surface of said stator teeth.

Regarding claim 16, Forbes et al. disclose said slot opening is within a range of 10% to 20% of said tooth pitch.

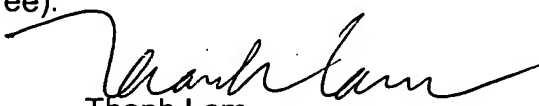
Regarding claim 17, Forbes et al. disclose a first air gap between an end of said crowned surface and said permanent magnets is within a range of 1 .25 to 2.00 times a second air gap between a center of said crowned surface and said permanent magnets.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Lam whose telephone number is (571) 272-2026. The examiner can normally be reached on t-f 9-7.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren E Schuberg can be reached on (571) 272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Thanh Lam
Primary Examiner
Art Unit 2834